

State of Kansas

Department of Health
and EnvironmentPermanent Administrative
RegulationsArticle 45b.—UNDERGROUND CRUDE OIL
STORAGE WELLS AND
ASSOCIATED BRINE PONDS

28-45b-1. Definitions. (a) "Active well" means an unplugged well that is in service or in monitoring status.

(b) "American petroleum institute gravity" and "API gravity" mean the specific gravity scale developed by the American petroleum institute for measuring the relative density of various petroleum liquids, expressed in degrees API.

(c) "Applicant" means the operator and the owner requesting a permit as specified in this article. If the operator and the owner are not the same person, the owner and the operator shall jointly submit an application for a permit.

(d) "Brine" means saline water with a sodium chloride concentration equal to or greater than 90 percent.

(e) "Brine pond" means the excavated or diked structure used for the surface containment of brine used in the creation, maintenance, and operation of an underground crude oil storage well.

(f) "Crude oil" means unrefined, liquid petroleum.

(g) "Crude oil reserve" means the storage of crude oil for future use.

(h) "Crude oil storage well," "underground crude oil storage well," and "storage well" mean a well used for the injection or withdrawal of crude oil into or out of an underground crude oil storage cavern.

(i) "Department" means Kansas department of health and environment.

(j) "Draft permit" means a document that is pending approval by the secretary to be issued as a permit.

(k) "Fracture gradient" means the pressure gradient, measured in pounds per square inch per foot, that causes the geological formations to physically fracture.

(l) "Freshwater" means water containing not more than 1,000 milligrams per liter of total dissolved solids (TDS).

(m) "Licensed geologist" means a geologist licensed to practice geology in Kansas by the Kansas board of technical professions.

(n) "Licensed professional engineer" means a professional engineer licensed to practice engineering in Kansas by the Kansas board of technical professions.

(o) "Licensed professional land surveyor" means a professional land surveyor licensed to practice land surveying in Kansas by the Kansas board of technical professions.

(p) "Liner" means the casing normally installed within the production casing.

(q) "Maximum allowable operating pressure" means the maximum pressure authorized by the department and measured at the product side of the wellhead.

(r) "Maximum allowable synthetic membrane liner leakage rate" means a monitored or a calculated leakage

rate of 10 percent of the collection and leak return system capacity.

(s) "Maximum operating pressure" means the maximum pressure monitored during a 24-hour period and measured at the product side of the wellhead.

(t) "Monitoring status" means temporary status for a well that has been placed out of service by removing the product and filling the cavern with brine.

(u) "Municipal population center" means an incorporated city.

(v) "Operator" means the person recognized by the secretary as being responsible for the physical operation of an underground crude oil storage facility or a brine pond.

(w) "Owner" means the person owning all or part of any underground crude oil storage facility or brine pond.

(x) "Permit" means an authorization, license, or equivalent control document issued to the owner and the operator by the secretary. A permit may be issued for any of the following:

(1) A new underground crude oil storage facility and the associated crude oil storage wells;

(2) an existing underground crude oil storage facility and the associated crude oil storage wells; or

(3) a brine pond.

(y) "Permittee" means the owner and the operator issued a permit, as defined in this regulation, by the secretary.

(z) "Person" means any individual, company, corporation, institution, association, partnership, municipality, township, and local, state, or federal agency.

(aa) "Plugged well" means a storage well that has been plugged or placed into plugging-monitoring status pursuant to K.A.R. 28-45b-18.

(bb) "Plugging-monitoring status" means the status of a storage well that will not be returned to active status but will be filled with brine to monitor cavern stabilization in lieu of plugging.

(cc) "Porosity storage" means the storage of hydrocarbon gas in underground porous and permeable strata that have been converted to hydrocarbon gas storage.

(dd) "Pressure gradient" means the ratio of pressure per unit depth, expressed as pounds per square inch per foot of depth.

(ee) "Product" means crude oil.

(ff) "Saturated brine" means saline water with a sodium chloride concentration that is equal to or greater than 90 percent.

(gg) "Secretary" means secretary of the department of health and environment.

(hh) "Solutioning" means the process of injecting fluid into a well to dissolve salt or any other readily soluble rock or mineral.

(ii) "Sour crude oil" means crude oil with a sulfur content greater than 0.5 percent.

(jj) "Supervisory control and data acquisition" means an automated surveillance system in which the monitoring and control of storage activities are accomplished at a central or remote location.

(kk) "Sweet crude oil" means crude oil with a sulfur content not greater than 0.5 percent by weight.

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(ll) "Type" means the description of the product that includes American petroleum institute gravity, non-hydrocarbon impurities, and hydrogen sulfide content.

(mm) "Underground crude oil storage cavern," "cavern," and "storage cavern" mean the storage space for crude oil created in a salt formation by solution mining.

(nn) "Underground crude oil storage facility" and "facility" mean the acreage associated with the storage field, with facility boundaries approved by the secretary. This term shall include the brine ponds, storage wells, well-bore tubular goods, the wellheads, and any related equipment, including any appurtenances associated with the well field.

(oo) "Unplugged," when used to describe a well, means a storage well that either is not plugged or is in plugging-monitoring status.

(pp) "Unsaturated brine" means saline water with a sodium chloride concentration less than 90 percent.

(qq) "Usable water formation" means an aquifer or any portion of the aquifer that meets any of the following criteria:

- (1) Supplies any public water system;
- (2) contains a supply of groundwater that is sufficient to supply a public water system and that currently supplies drinking water for human consumption; or
- (3) contains fewer than 10,000 milligrams per liter total dissolved solids and is not an exempted aquifer.

(rr) "Variance" means the secretary's written approval authorizing an alternative action to one or more of the requirements of these regulations. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-2. Permit required for facilities and storage wells; variances. (a) No person shall create, operate, or maintain an underground crude oil storage facility or any crude oil storage well without first obtaining a permit from the secretary.

(b) The storage of crude oil in caverns constructed in any rock formations other than bedded salt shall be prohibited.

(c) A variance to any requirement of this article may be granted by the secretary if both of the following conditions are met:

- (1) The variance is protective of public health, safety, and the environment.
- (2) The applicant or permittee agrees to perform any additional testing, monitoring, or well improvements, or any combination, if required by the secretary.

(d) Each applicant or permittee seeking a variance shall submit a written request, including justification for the variance and any supporting data, to the secretary for review and consideration for approval. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-3. Well conversions and reentry. (a) The conversion of an existing well that was not originally designed for crude oil storage to an underground crude oil storage well shall be considered for approval if both of the following conditions are met:

- (1) The applicant submits a completed application as required by K.A.R. 28-45b-4.

(2) The secretary determines that the conversion is protective of public health, safety, and the environment.

(b) Any permittee may convert an unplugged underground crude oil storage well to monitoring status if all of the following requirements are met:

(1) Each permittee shall verify the integrity of the storage well and cavern by conducting a mechanical integrity test before converting the well to monitoring status.

(2) Each permittee shall run a gamma-density log, a thermal neutron decay time log, or a pulsed neutron log to verify the roof thickness before converting the well to monitoring status.

(3) Each permittee shall meet the requirements specified in the department's document titled "procedure for converting a crude oil storage well to monitoring status," procedure #UICLPG-27, dated October 2008, which is hereby adopted by reference.

(4) Each permittee of an underground crude oil storage cavern that is in monitoring status shall conduct a casing inspection evaluation before placing the cavern into service. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-4. Permit required for facility and associated storage wells. (a) Each applicant who intends to construct a new underground crude oil storage well shall submit a completed permit application to the secretary, on a form approved by the department, at least 180 days before the proposed commencement date for the construction of the new crude oil storage well. Well construction shall not begin until the secretary has issued the permit.

(b) Each applicant who intends to convert an existing well to a crude oil storage well shall submit a completed permit application to the secretary, on a form approved by the department, at least 180 days before the proposed date for operation of the crude oil storage well. Well modifications and operations shall not commence until the secretary has issued the permit.

(c) Each applicant who intends to construct a new storage well for the purpose of creating a crude oil reserve shall submit a completed permit application to the secretary at least 180 days before the proposed commencement date for storage well construction. Well construction shall not begin until the secretary has issued the permit.

(d) Each applicant who wishes to convert an existing storage well for the purpose of creating a crude oil reserve shall submit a completed permit application to the secretary at least 180 days before the proposed date for operation of the crude oil storage well. Well modifications and operations shall not commence until the secretary has issued the permit.

(e) Each applicant who intends to create a crude oil reserve shall include the following with the permit application:

(1) A description of monitoring and testing methods to demonstrate that the quality of the crude oil is maintained during storage;

(2) a description of methods and a schedule for routinely testing the integrity of the wellhead, casing, and transfer equipment; and

(3) a description of the brine transfer system, including brine source, disposal method, and means of transfer.

(f) Upon review of each application, one of the following shall be issued by the secretary:

(1) A permit, if the application is approved; or

(2) a notice that the permit has been denied if the applicant has not complied with the requirements of this article. The notice shall include justification for the permit denial.

(g) Each application for a permit shall include a report prepared by a licensed geologist and shall include the following:

(1) An evaluation of the geology and hydrogeology, including cross-sections, isopach and structure maps of the salt formation, and water-level or potentiometric maps;

(2) a regional stratigraphic evaluation;

(3) local and regional structural analyses, including maps, cross-sections, and available geophysical data;

(4) a flood assessment identifying floodplain and flood-prone areas, including the following:

(A) Flood response procedures; and

(B) design criteria for the well and facility equipment; and

(5) an assessment of the potential for ground subsidence.

(h) Each applicant shall submit the following information with the application:

(1) A plan view map showing locations of all water, solution-mining, storage, monitoring, disposal, injection, oil, and gas wells within a one-mile perimeter of the facility's boundary; and

(2) a plan view map of man-made surface structures and activities within a one-mile perimeter of the facility's boundary.

(i) Each permittee shall submit a compliance audit every 10 years, on a form furnished by the department, for review and consideration for approval for the continued operation of each storage well.

(j) Each permittee shall submit a sample log of well cuttings from any new well drilled at the facility, including new crude oil storage wells, monitoring wells, and stratigraphic test holes.

(1) Cuttings shall be collected at 10-foot intervals from surface to total well depth or at an interval specified by the department.

(2) Well cuttings shall be collected, described, and logged as specified in the department's document titled "procedure for sample logging," which is adopted by reference in K.A.R. 28-45-6a.

(3) The collection of cuttings shall be supervised by a licensed geologist or a licensed geologist's designee.

(4) The description and logging of the sample cuttings shall be performed by a licensed geologist.

(5) Each permittee shall submit a sample log and a dry sample set to the department within 45 days after the completion of the well.

(k) Each permittee shall provide a minimum of one core from each facility. The following provisions shall apply:

(1) Each permittee shall submit a plan for a new core describing the coring interval, coring procedures, and core testing with the permit application to the secretary

for review and consideration for approval. The plan shall be submitted at least 60 days before the coring event.

(2) Each permittee shall submit the core analysis for a new core after installing the first storage well and before developing the storage field.

(3) Any permittee may submit existing core data if the secretary determines that the core is representative of the geology of the area.

(4) Each permittee shall submit the core analysis for an approved existing core with the permit application.

(5) Each permittee shall make the core available for inspection upon request by the secretary.

(l) Each permittee shall submit a water analysis for any water-bearing formation encountered in drilling a new monitoring well. The water shall be analyzed for the following parameters:

(1) Chloride;

(2) total dissolved solids; and

(3) any parameter that the secretary determines could pose a potential threat to public health, safety, and the environment.

(m) Each permittee shall ensure that the stored crude oil, formation water, lithology, and substances used in the solution of the storage caverns are compatible.

(n) Each permittee shall submit open-hole logs for any new crude oil storage well. The logging interval shall be from the surface to at least 100 feet below the top of the salt section. At a minimum, the following logs shall be run:

(1) A gamma ray log;

(2) a neutron log, if the source is registered in Kansas, or a sonic log;

(3) a density log; and

(4) a caliper log.

(o) Any permittee may use an alternative log if the secretary determines that the alternative log is substantially equivalent to one of the logs specified in subsection (n). The permittee shall submit the following information:

(1) A description of the log and the theory of operation for that log;

(2) a description of the field conditions under which the log can be used;

(3) the procedure for interpreting the log; and

(4) an interpretation of the log upon completion of the logging event.

(p) If a facility has a new storage cavern, the permittee shall ensure that a minimum salt roof thickness of 100 feet is maintained above the storage cavern.

(q) Each permittee shall submit supporting data showing that a minimum crude oil inventory in each storage cavern shall be maintained to protect the salt roof during short time periods when changing service, conducting workover activities, or performing surface facility maintenance.

(r) If a facility has an existing cavern approved for crude oil storage with a salt roof thickness greater than 50 feet but less than 100 feet, the permittee shall meet the following requirements:

(1) The permittee shall use only saturated brine to displace product.

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(2) The permittee shall submit a schedule for monitoring brine salinity.

(3) The salt roof thickness shall be monitored with gamma ray and density logs, or any other log specified in subsection (o), every three years.

(4) The permittee shall provide any additional information, including a geomechanical study from core analysis, that may be requested by the secretary to verify the integrity of the salt roof.

(s) Underground crude oil storage caverns with a salt roof thickness of 50 feet or less shall be prohibited.

(t) Underground communication between underground crude oil storage caverns in the upper 50 feet of the salt formation shall be prohibited.

(u) Underground communication between underground crude oil storage caverns below the upper 50 feet of the salt formation shall be prohibited, unless the secretary determines that the communication is protective of public health, safety, and the environment. The permittee shall submit the following:

(1) A sonar survey for each cavern that is in communication with another cavern; and

(2) a plan describing the monitoring and testing that the permittee will conduct to ensure that the integrity of the underground crude oil storage wells and caverns will be maintained.

(v) The horizontal distance separating new underground crude oil storage caverns shall be at least 100 feet between the cavern boundaries.

(w) Any existing cavern approved for crude oil storage with horizontal separation less than 100 feet may operate if the following requirements are met:

(1) Each permittee shall submit a justification for each existing underground crude oil storage cavern with horizontal separation less than 100 feet. The following requirements shall apply:

(A) The justification shall include spacing-to-diameter ratios, cavern pressure differentials, and analyses of cavern shape, size, and depth.

(B) The horizontal spacing shall be reevaluated every five years.

(2) Horizontal spacing of less than 50 feet between caverns shall be prohibited.

(x) The maximum horizontal diameter of each cavern shall not exceed 300 feet.

(y) Each permittee shall ensure the integrity of the storage well, including the wellhead and casing, and storage cavern before commissioning any new storage cavern into service. Storage operations may commence when the following requirements are met:

(1) The permittee shall submit a notice of completion of construction on a form furnished by the department.

(2) Each new storage well shall be inspected by the secretary before storage operations commence. If the well fails the inspection, the permittee shall not commence storage operations. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-5. Public notice. (a) Public notice shall be given by the secretary for any of the following permit actions:

(1) Any permit application for a crude oil storage well;

(2) the denial of a permit; or

(3) a scheduled hearing.

(b) Public notice and, if applicable, a copy of the draft permit shall be mailed or electronically mailed by the department to the permit applicant.

(c) Each public notice shall be mailed by the department to the following:

(1) Any person who submits a written request for placement on the mailing list;

(2) the official county newspaper of each county in which the lands affected by the application are located, for publication in at least two issues; and

(3) the Kansas register.

(d) Each public notice shall include the following information:

(1) The name and address of the department processing the permit action for which the notice is being given;

(2) the name and address of the person or company seeking the permit;

(3) a brief description of the business conducted at the facility or the activity described in the permit application;

(4) the name, address, and telephone number of the departmental contact whom interested persons may contact for further information, including copies of the application, draft permit, or any other appropriate information;

(5) a brief description of the comment procedures for public notice; and

(6) a statement of the procedure to request a hearing and any other procedures that allow public participation in the final permit decision.

(e) Any interested person may submit written comments on any permit action to the secretary during the 30-day public comment period. The following requirements shall apply:

(1) All comments shall be submitted by the close of the public comment period.

(2) All supporting materials submitted shall be included in full. The supporting materials shall not be incorporated by reference, unless the supporting materials are any of the following:

(A) Part of the administrative record in the same proceeding;

(B) state or federal statutes and regulations;

(C) state or environmental protection agency documents of general applicability; or

(D) other generally available reference materials.

(3) Commentators shall make supporting materials not already included in the administrative record available to the secretary.

(f) The response to all relevant comments concerning any permit actions and the reasons for changing any provisions in the draft permit shall be issued when the permit decision is issued.

(g) The response to comments shall be made available to the public upon request. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-6. Modification and transfer of a permit.

(a) The automatic transfer of a permit shall be prohibited.

The requirements for each permit transfer shall be as follows:

(1) Each person requesting a permit transfer shall notify the secretary at least 60 days before the effective date of the proposed transfer.

(2) Each owner and each operator shall comply with the conditions of the existing permit until the secretary reissues the permit.

(b) Any permit may be modified by the secretary under any of the following conditions:

(1) The secretary receives information that was not available when the permit was issued.

(2) The secretary receives a request for the modification of a permit.

(3) The secretary conducts a review of the permit file and determines that a modification is necessary.

(c) Only the permit actions subject to modification shall be reopened.

(d) Minor modifications that do not require public notification shall include the following, except as otherwise specified:

(1) Correction of typographical errors;

(2) requirements for more frequent monitoring or reporting by the permittee;

(3) a date change in a schedule of compliance;

(4) a change in ownership or operational control of the facility, unless the secretary determines that public notification is necessary to protect the public interest;

(5) a change in construction requirements, if the secretary determines that the change is protective of public health, safety, and the environment; and

(6) any amendments to a facility plugging plan.

(e) A draft permit and notification to the public shall be required if any of the following conditions is met:

(1) A permittee proposes substantial alterations or additions to the facility or proposes an activity that justifies a change in the permit requirements, including cumulative effects on public health, safety, or the environment.

(2) Information has become available that would have initially justified different permit requirements.

(3) Regulations on which the permit was based have changed due to the promulgation of new or amended regulations or due to a judicial decision after the permit was issued.

(f) Any permittee may request a permit modification within 180 days after any of the following:

(1) The adoption of new regulations;

(2) any deadline to achieve compliance with regulations; or

(3) any judicial remand and stay of a promulgated regulation if the permit requirement was based on the remanded regulation. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-7. Signatories for permit applications and reports. (a) Each applicant for a permit shall designate at least one signatory to sign the permit applications and all reports required by the secretary.

(b) The positions that may be approved by the secretary to be signatories shall be the following:

(1) Plant or operations manager;

(2) cavern specialist;

(3) superintendent; and

(4) any position with responsibility at least equivalent to that required by the positions listed in this subsection.

(c) Any signatory may submit written notification to the secretary specifying a position having responsibility for the overall operation of the facility or activity to act as a designated signatory.

(d) Each signatory and each signatory's designee shall submit a signature statement, on a form furnished by the department, to the secretary with each permit application. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-8. Siting requirements for new storage wells and facilities. (a) Each applicant shall assess the geographical, topographical, and physical data for any proposed underground crude oil storage well location to determine whether siting requirements have been met. The following siting requirements shall be met:

(1) Each new storage facility shall be located at least three miles from the established boundaries of municipal population centers.

(2) Each proposed new facility or boundary expansion for an existing facility shall be located as follows:

(A) Not less than five miles from an active or abandoned conventional shaft mining operation; and

(B) not less than two miles from the facility's boundary of any solution mining operation.

(3) Each applicant shall assess the extent and nature of current or past conventional subsurface mining activities within five miles of the underground crude oil storage facility's boundary to determine any potential impact to public health, safety, or the environment resulting from the proposed activities at the facility.

(4) Each applicant shall identify and assess all wells, including abandoned wells, from available sources of information, within a one-mile perimeter of the facility's boundary to determine if the following conditions are met:

(A) The wells have been constructed in a manner to protect public health, property, and the environment.

(B) The abandoned wells, including water, oil, gas, monitoring, and underground storage wells, have been properly plugged.

(b) Each applicant shall conduct a regional geological evaluation to determine if the integrity of each proposed storage cavern will be adversely affected by any of the following:

(1) Salt thinning due to any stratigraphic change;

(2) a dissolution zone in the bedded salt; or

(3) abrupt changes in the lithology within the salt interval.

(c) Each applicant shall determine if the facility's location is in a floodplain or flood-prone area.

(d) No new facility's boundary or the expansion of an existing facility's boundary shall be located less than one mile from any existing underground porosity storage facility.

(e) Each applicant shall identify potential risks to the storage operation from activities conducted at adjacent facilities.

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(f) Each applicant shall identify all utilities having a right-of-way, including pipeline, railway, roadway, and electrical lines, and shall assess the potential impact of the utilities on the location or operation of the facility. If a facility is exposed and subject to hazards, including vehicular traffic, railroads, electrical power lines, and aircraft traffic, the facility shall be protected from accidental damage, by distance or barricades.

(g) No outer boundary of an underground crude oil storage cavern shall be less than 100 feet from any of the following:

(1) The property boundary of any owners who have not consented to subsurface storage under their property;

(2) any existing surface structure not owned by the facility's owner; or

(3) any public transportation artery. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-9. Financial assurance for closure of underground crude oil storage facility. (a) Each applicant shall submit, with the permit application and annually thereafter on or before the permit renewal date, proof of financial assurance to the secretary for the following:

(1) Closure of the facility; and

(2) the plugging of any crude oil storage well.

(b) Each applicant shall meet the following requirements:

(1) Submit a detailed written estimate, in current dollars, of the cost to close all underground storage wells and storage caverns at the proposed facility following the closure procedures specified in K.A.R. 28-45b-18. The estimate shall be reviewed and approved by a licensed professional engineer or licensed geologist; and

(2) prepare an estimate of the closure cost for all storage wells and storage caverns at the proposed facility based on the cost charged by a third party to plug the underground storage wells.

(c)(1) Each permittee shall increase the closure cost estimate and the amount of financial assurance provided if any change in the facility operation or closure plan increases the maximum cost of closure at any time.

(2) Each permittee shall provide continuous financial assurance coverage for closure until the secretary approves the facility closure.

(d) Each permittee shall comply with the provisions of the department's document titled "procedure for demonstrating financial assurance for an underground crude oil storage well," procedure #UICLPG-28, dated October 2008, which is hereby adopted by reference. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-10. Operations and maintenance plan. (a) Each applicant shall submit a plan for the long-term operation and maintenance of the facility with the permit application.

(b) Each operation and maintenance plan shall include the following information:

(1) A description of the methods to be used to prevent the overpressuring of wells and storage caverns;

(2) a plan view map of the location of any disposal wells and corrosion control wells; and

(3) the location, depth, and well construction for all shallow and deep groundwater monitoring and observation wells.

(c) Each permittee shall maintain at the facility and make available for inspection by the secretary the following information:

(1) A location map of all wells within the facility's boundaries and a listing of the global positioning system coordinates for each well;

(2) a schematic of the brine and product lines for each cavern; and

(3) a schematic of the gathering line system that connects all wells within the underground crude oil storage facility to a central distribution point.

(d) Each applicant shall submit a plan for solutioning or washing any cavern to the secretary for review and consideration for approval. The plan shall include the following:

(1) A list of acceptable blanket pad materials;

(2) methods for monitoring the solutioning or washing process; and

(3) a monitoring schedule.

(e) Only saturated brine shall be used to displace any product.

(f) The maximum allowable operating pressure and test pressure shall not exceed 0.8 pounds per square inch per foot of depth measured at the higher elevation of either the casing seat or the highest interior elevation of the storage cavern roof.

(g) Each permittee shall submit justification for a minimum operating pressure that is protective of cavern integrity and shall maintain the minimum operating pressure at each storage well.

(h) Each permittee shall meet the notification requirements in the facility's emergency response plan, give oral notification to the department within two hours, and submit written notification within one week to the department if any of the following events occurs:

(1) The overpressuring or the overfilling of an underground crude oil storage cavern;

(2) the loss of integrity for an underground crude oil storage well or cavern;

(3) the release of brine, product, or any other chemical parameter that poses a threat to public health, safety, or the environment;

(4) any uncontrolled or unanticipated loss of product or brine that is detectable by any monitoring or testing;

(5) any other condition that could endanger public health, safety, or the environment;

(6) the establishment of communication between storage caverns;

(7) the triggering of any alarms verifying that the permit safety requirements have been exceeded; or

(8) any equipment malfunction or failure that could result in potential harm to public health, safety, or the environment.

(i) Each permittee shall notify the secretary of any change in the type of product stored in any storage cavern and shall certify that the compatibility of product types and the changes in pressure will not adversely affect the wellhead, casing, tubing, and cavern. (Authorized by

K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-11. Emergency response plan and safety and security measures. (a)(1) Each applicant for a permit for an underground crude oil storage facility shall make the emergency response plan available for inspection by the secretary when the permit application is submitted to the department.

(2) Each permittee shall maintain the emergency response plan at the facility and at the company headquarters and shall make the plan available for inspection by the secretary.

(b) Each permittee shall update the emergency response plan annually and also shall update the plan whenever new information regarding the requirements for the emergency response plan becomes available.

(c) Each emergency response plan shall include a description of the facility's response to the following events:

- (1) Spills and releases;
- (2) fires and explosions;
- (3) cavern subsidence and collapse; and
- (4) any other activity that endangers public health and safety or that constitutes a threat to the environment.

(d) Each emergency response plan shall include the following information:

(1) A description of the warning systems in operation at the facility;

(2) a description of the facility's emergency response communication system that includes the following:

(A) A plat showing the location of all occupied buildings within a two-mile perimeter of the facility's boundaries; and

(B) a list of addresses and telephone numbers for all persons to contact within a two-mile perimeter of the facility's boundaries if a release or emergency condition occurs;

(3) the procedures for coordination of emergency response with local emergency planning committees, including emergency notification and evacuation of citizens and employees;

(4) a description of employee training for emergency response;

(5) a plat of the facility, showing the following locations:

- (A) All crude oil storage wells;
- (B) all underground injection control wells;
- (C) all monitoring wells;
- (D) all brine and product lines;
- (E) railroad and transportation routes;
- (F) brine ponds; and
- (G) any other appurtenances at the facility; and
- (6) a plan map of man-made surface structures and any construction activities within a one-mile perimeter of the facility's boundaries.

(e) A copy of the emergency response plan shall be available at the facility, the company headquarters, and the office of each coordinating agency or committee involved in the emergency response plan.

(f) Each permittee shall establish an educational program for community safety and awareness of the emergency response plan.

(g) Each permittee of an underground crude oil storage facility shall provide security measures to protect the public and to prevent unauthorized access. These security measures shall include the following:

(1) Methods for securing the facility from unauthorized entry and for providing a convenient opportunity for escape to a place of safety;

(2) at least one visible, permanent sign at each point of entry and along the facility's boundary, identifying the storage well or facility name, owner, and contact telephone number;

(3) security lighting;

(4) alarm systems;

(5) appropriate warning signs in areas that could contain accumulations of hazardous or noxious vapors or where physical hazards exist; and

(6) a direct communication link with the local control room or any remote control center for service and maintenance crews.

(h) Warning systems and alarms shall consist of the following:

(1) Combustible gas detectors, hydrogen sulfide detectors, heat sensors, pressure sensors, and emergency shutdown instrumentation integrated with warning systems audible and visible in the local control room and at any remote control center;

(2) circuitry designed so that the failure of a detector or heat sensor, excluding meltdown and fused devices, will activate the warning; and

(3) a manually operated alarm that is audible to facility personnel.

(i) Each wellhead shall be protected with safety devices to prevent pressures in excess of the maximum allowable operating pressure from being exerted on the storage well or cavern and to prevent the backflow of any stored crude oil if a flowline ruptures.

(j) Each wellhead shall be equipped with manual isolation valves. Each port on a wellhead shall be equipped with either a valve or a blind flange. The valve or blind flange shall be rated at the same pressure as that for the wellhead.

(k) Each permittee shall ensure that the facility has a supervisory control and data acquisition system approved by the secretary to monitor storage operations for individual storage wells. Each of the following instruments shall be connected to an alarm:

(1) Flow indicators for crude oil;

(2) combustible gas and hydrogen sulfide detection indicators; and

(3) pressure indicators on both the product and brine lines at the wellhead.

(l) Each permittee shall install emergency shutdown valves on all crude oil, brine, and water lines. Criteria for emergency shutdown valves shall include the following:

(1) (A) Be rated at least equivalent to 125 percent of the maximum pressure that could be exerted at the surface; or

(B) meet a pressure-rating standard equivalent to that specified to that in paragraph (l)(1)(A) and determined by the secretary to be protective of public health, safety, and the environment;

(continued)

- (2) fail to the closed position;
- (3) be capable of remote and local operation; and
- (4) be activated by the following:
 - (A) Overpressuring;
 - (B) underpressuring; and
 - (C) gas and heat detection.
- (m) Each permittee shall conduct annual inspections of all wellhead instrumentation.
- (n) Each permittee shall function-test each critical control system and emergency shutdown valve semiannually.
- (o) Each permittee shall perform trip-testing of each loop, including the instrumentation, valves, shutdown equipment, and all wiring connections, to ensure the integrity of the circuit.
- (p) Each permittee shall ensure that the equipment automatically closes all inlets and outlets to the storage cavern and safely shuts down or diverts any operation associated with the storage cavern, in case of overfilling or an emergency.
- (q) Each permittee shall ensure that the automatic valve closure times meet the valve design limits for closure times.
- (r) Each permittee shall cease operations or shall comply with the instructions from the secretary if the secretary determines that an imminent threat to public health, safety, or the environment exists due to any unsafe operating condition. The permittee may resume operations if the secretary determines that the facility's operations no longer pose a risk to public health, safety, or the environment. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-12. Design and construction of storage wells. (a) Each permittee shall ensure that each storage well is constructed with surface casing. The following requirements shall apply:

- (1) The surface casing shall be set through all fresh and usable water formations and into competent bedrock.
- (2) The surface casing shall be cemented by circulating cement through the bottom of the casing to the surface.
- (3) The annular space between the casing and the formation shall be filled with cement.
- (b) Each permittee shall install in each storage well double casing protection with an intermediate casing and a production casing set into the upper part of the salt formation. The following requirements shall apply:
 - (1) The intermediate casing shall extend at least 105 feet into the salt formation.
 - (2) The production casing shall extend at least to the depth of the intermediate casing.
 - (3) The annular space between the intermediate and production casings and between the intermediate casing and formation shall be filled with cement by circulating cement through the bottom of the casing to the surface.
 - (c) For each existing storage well that does not have double casing protection, the permittee shall provide a casing protection evaluation as specified in K.A.R. 28-45b-14.
 - (d) The casing and tubing shall meet the performance standards for collapse resistance, internal yield pressure,

and pipe body yield strength for the well's setting depths using criteria specified in the American petroleum institute's bulletin 5C2, which is adopted by reference in K.A.R. 28-45-14.

(e) Each permittee shall designate and maintain a maximum fill level above the bottom of the brine string. The permittee shall submit the following information:

- (1) A schematic of the well construction;
- (2) the cavern capacity as determined from the most recent sonar survey;
- (3) supporting data that shows calculations used to determine the maximum fill level; and
- (4) the method that will be used to maintain the maximum fill level.

(f) Only new steel casing shall be installed in a new storage well. Used parts, materials, and equipment that have been tested and certified for continued service may be used for repairs.

(g) Liners shall extend from the surface to a depth near the bottom of the production casing that allows room for workover operations.

(h) The following cementing requirements shall be met:

(1) The cement shall be compatible with the rock formation water and the drilling fluids. Salt-saturated cement shall be used when cementing through the salt section.

(2) The cement across the confining zone and to the surface shall have a compressive strength of not less than 1,000 pounds per square inch.

(3) Remedial cementing shall be completed if there is evidence of either of the following:

(A) Communication between the confining zone and other horizons; or

(B) annular voids that would allow either fluid contact with the casing or channeling across the confining zone or above the confining zone.

(4) The following requirements for cement evaluation shall apply:

(A) Samples shall be obtained at the start and end of the cementing operation for evaluation of cement properties. All cement samples collected shall be representative of the cement being utilized.

(B) All samples shall be tested for compressive strength.

(C) A cement bond log shall be run on the surface casing, intermediate casing, and cemented production casing after the neat cement has cured for at least 72 hours.

(i) Casing patches shall be prohibited, unless the secretary determines that the use of casing patches is protective of public health, safety, and the environment. The following requirements shall apply:

(1) Each permittee shall submit a plan for the installation of the casing patch to the secretary.

(2) Each permittee shall meet the requirements specified in the department's document titled "procedure for internal casing repair," which is adopted by reference in K.A.R. 28-45-14.

(j) Each permittee shall pressure-test each production casing for leaks when the well construction is completed.

(k) Each permittee shall submit a casing inspection base log for the entire cased interval for the innermost casing string or for the cemented liner that extends the entire

length of the casing after the well construction is completed.

(l) Each permittee shall contain, in a tank, all workover wastes, drilling fluids, drilling mud, and drill cuttings from any drilling operation or workover. Drilling fluids, drilling mud, and drill cuttings shall be disposed of in a manner determined by the secretary to be protective of public health, safety, and the environment.

(m) A licensed professional engineer shall review and approve the construction plans for the crude oil storage well and cavern system.

(n) A licensed professional engineer or a licensed geologist, or the licensed professional engineer's or licensed geologist's designee, shall supervise the installation of each storage well.

(o) Each permittee shall maintain a corrosion control system. The following requirements shall apply:

(1) The corrosion control system shall be capable of protecting the well casings.

(2) The corrosion control system shall be assessed according to the protocol and time schedule recommended by the corrosion control system manufacturer, and the results shall be reported to the secretary. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-13. Monitoring. (a) Each permittee shall ensure that pressure sensors continuously monitor wellhead pressures for both the product and brine sides at the wellhead for each storage well. The following requirements shall apply:

(1) The pressure sensor shall be capable of recording the maximum and minimum operating pressures during a 24-hour period.

(2) The pressure sensor shall be capable of recording operating pressures at an interval approved by the secretary.

(3) Each permittee shall provide pressure data, including historic continuous monitoring, to the secretary upon request.

(b) Each permittee shall submit a plan for any monitoring activity, including logging and sonar surveys, to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment, at least 60 days before the commencement of these monitoring activities.

(c) Each permittee shall submit a summary and the results of the monitoring activity to the secretary within 45 days after completion of the monitoring activity.

(d) Each permittee shall monitor the thickness of the salt roof for each cavern with a gamma ray log and a density log, or with another log as specified in K.A.R. 28-45b-4, as follows:

(1) Every five years;

(2) every three years, if the cavern meets criteria specified in K.A.R. 28-45b-4;

(3) at any time that the secretary determines that cavern integrity is suspect; and

(4) before plugging the well.

(e) Each permittee shall monitor the cavern storage capacity and the cavern geometry with a sonar survey. The sonar survey shall be conducted as follows:

(1) Before placing the underground crude oil storage cavern in service;

(2) every 10 years;

(3) for determining the stability of the cavern and the overburden if the salt roof thickness and cavern geometry indicate that the stability of the cavern or overburden is at risk;

(4) after any growth of the cavern that results in a solution volume increase of 20 percent or more of cavern capacity; and

(5) before plugging the well if a sonar survey has not been run in the past five years.

(f) Any permittee may use an alternative method for the sonar survey if the secretary determines that the alternative method is substantially equivalent to the method specified in subsection (e). The permittee shall submit the following information for the secretary's consideration:

(1) A description of the proposed method and the theory for its operation;

(2) a description of the storage well and cavern conditions under which the log can be used;

(3) the procedure for interpreting the survey results; and

(4) an assessment of the capacity and stability of the cavern upon completion of the survey.

(g)(1) Each applicant shall submit a ground subsidence monitoring plan to the secretary with the permit application. The ground subsidence monitoring plan shall include the following information:

(A) A description of the method for conducting an elevation survey; and

(B) the criteria for establishing monuments, benchmarks, and wellhead survey points.

(2)(A) Each permittee shall meet the following requirements:

(i) Ensure level measurements to the accuracy of 0.01 foot;

(ii) report any surface elevation changes in excess of 0.10 foot within 24 hours to the secretary;

(iii) for any change in established benchmarks, submit justification that the change is protective of public health, safety, and the environment; and

(iv) for each change in established benchmarks, note the elevation change from the previous benchmark noted in the elevation survey report.

(B) Each permittee shall submit the elevation before and after any wellhead work that results in a change in the survey point at the wellhead.

(C) The elevation survey shall be conducted by a licensed professional land surveyor.

(D) Each permittee shall submit biennial survey results to the department within 30 days after completion of the survey.

(h) Before commencing facility operations, each permittee shall submit to the secretary, for review and consideration for approval, an inventory balance plan for measuring the volume of crude oil injected into or withdrawn from each underground crude oil storage well, including methods for measuring and verifying volume. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-

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1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-14. Testing and inspections. (a) Each permittee shall submit a plan to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment, before conducting any testing of a storage well or a cavern. Testing shall not commence without prior approval from the secretary.

(b) Each permittee shall submit a summary of the testing to the secretary within 45 days after completing the test. The summary shall include the following:

- (1) A chronology of the test;
- (2) copies of all logs;
- (3) storage well construction information;
- (4) pressure readings;
- (5) volume measurements; and
- (6) an explanation of the test results.

(c) Each permittee shall test each unplugged storage well and cavern for mechanical integrity. The following requirements shall apply:

(1) Integrity tests shall be conducted on the storage well and cavern as follows:

- (A) Before the cavern is initially placed in service;
- (B) every five years after the initial service date;
- (C) before the storage well is placed back in service after being in monitoring status; and
- (D) before the well is plugged, unless the mechanical integrity test has been performed in the last five years.

(2) Integrity tests shall be conducted on the underground crude oil storage well after each workover that involves physical changes to any cemented casing string.

(3) Each underground crude oil storage cavern shall be tested for mechanical integrity using a product-brine interface test.

(4) The nitrogen-brine test may be used if the surface equipment is rated for the nitrogen pressure on the upstream side of the well head valves.

(5) Each underground crude oil storage well shall be tested for mechanical integrity using one of the following:

- (A) An interface test capable of identifying the location of a leak in the casing; or
- (B) a hydraulic casing test.

(6) Each permittee shall submit a test procedure plan, on a form furnished by the department, to the secretary for review and consideration for approval at least 30 days before test commencement. The plan shall include the following information:

- (A) The justification for test parameters;
- (B) the test sensitivities; and
- (C) the pass and fail criteria for the test.

(7) Each permittee shall notify the secretary at least five days before conducting any integrity test.

(8) The integrity test shall be conducted at the maximum allowable operating pressure.

(9) All test procedures shall use certified gauges and pressure transducers that have been calibrated annually.

(d) Any permittee may use an alternative integrity test if the secretary determines that the alternative integrity test is substantially equivalent to the integrity tests spec-

ified in subsection (c). The permittee shall submit the following information for the secretary's consideration:

(1) A description of the test method and the theory of operation, including the test sensitivities, a justification for the test parameters, and the pass and fail criteria for the test;

(2) a description of the well and cavern conditions under which the test can be conducted;

(3) the procedure for interpreting the test results; and

(4) an interpretation of the test upon completion of the test.

(e) No storage well and cavern shall be used for storage if the mechanical integrity is not verified.

(f) Each permittee shall submit a casing evaluation for each underground crude oil storage well. Acceptable casing evaluation methods shall include magnetic flux and ultrasonic imaging.

(g) Any permittee may use an alternative casing evaluation method if the secretary determines that the alternative casing evaluation method is substantially equivalent to the casing evaluation methods specified in subsection (f). The permittee shall meet the following requirements:

(1) Each permittee shall submit a description of the logging method, including the theory of operation and the well conditions suitable for log use.

(2) Each permittee shall submit the specifications for the logging tool, including tool dimensions, maximum temperature and pressure rating, recommended logging speed, approximate image resolution, and hole size range.

(3) Each permittee shall describe the capabilities of the log for determining the following:

(A) The presence of any metal loss due to either of the following:

- (i) Internal or external corrosion; or
- (ii) internal wear;

(B) the degree of penetration of the corrosion or the casing defect; and

(C) the circumferential extent of the corrosion or the casing defect.

(4) Each permittee shall submit a log and an interpretation of the log to the secretary.

(h) Each permittee shall submit a casing evaluation according to the following time schedule:

(1) Every 10 years for either of the following conditions:

- (A) The storage well has double casing protection; or
- (B) an existing storage well has a liner and a production casing;

(2) after any workover involving the cemented casing; and

(3) every five years, if the storage well does not have double casing protection or if a determination is made by the secretary that the integrity of the long string casing could be adversely affected by any naturally occurring condition or man-made activity.

(i) Each permittee shall submit a cement bond log with the casing evaluation if a cement bond log has not been previously submitted.

(j) A licensed professional engineer or licensed geologist, or licensed professional engineer's or licensed geol-

ogist's designee, shall supervise all test procedures and associated field activity.

(k) Each permittee shall have a licensed professional engineer or licensed geologist review all test results.

(l) Each permittee shall visually inspect each wellhead monthly for any leakage.

(m) Each permittee shall conduct an inspection of facility records, using a form furnished by the department, every two years to ensure that the required records are being maintained in accordance with these regulations. The permittee shall maintain these records at the facility and shall make the records available to the secretary upon request. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-15. Groundwater monitoring. (a) Each applicant shall submit a groundwater monitoring plan with the permit application to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment.

(b) Each permittee shall ensure that the groundwater monitoring wells meet the following requirements:

(1) Each permittee shall set the screen in each shallow monitoring well at a depth that is inclusive of the seasonal fluctuation of the water table.

(2) Each permittee shall ensure that all deep groundwater monitoring wells extend a minimum of 25 feet into the bedrock, or to a depth based on the geology and hydrogeology at the facility and approved by the secretary to ensure the protection of public health, safety, and the environment.

(c) All well locations and the spacing between all well locations shall be based on the geology and the hydrogeology at the facility and shall be required to be approved by the secretary to ensure the protection of public health, safety, and the environment.

(d) Before commencing facility operations, each applicant shall submit a quality assurance plan, including techniques for sampling and analysis, to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment.

(e) Each permittee shall collect groundwater samples and analyze the samples for chlorides and any other parameter determined by the secretary to pose a threat to public health, safety, and the environment. The reporting format shall be determined by the secretary.

(f) Each permittee shall submit the results for chloride analyses from groundwater samples to the department on a quarterly basis.

(g) Each permittee shall monitor monthly for the presence of combustible gas in the headspace in monitoring wells and shall quarterly submit the results to the department.

(h) Each permittee shall submit a static groundwater level measurement for each monitoring well with the quarterly chloride analyses results specified in subsection (f).

(i) Any permittee of a facility where chloride concentrations in the groundwater exceed 250 milligrams per liter may be required by the secretary to submit a work plan, for review and consideration for approval, that de-

scribes the methods to delineate potential source areas and to control migration of the chloride contamination.

(j) Each permittee of a well in which combustible gas is detected shall submit a work plan to the secretary for review and consideration for approval. Each permittee shall describe the proposed methods to eliminate any source areas and return the combustible gas levels to levels that do not pose a potential threat to public health, safety, or the environment. The plan shall be approved if the secretary determines that the plan is protective of public health, safety, and the environment. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-16. Record requirements and retention. (a) Each permittee shall submit an annual report, on a form approved by the department, on or before April 1 of each year. The annual report shall include the following:

(1) A description of any incident of uncontrolled or unanticipated product loss;

(2) the well number and date of any logs or sonar surveys conducted;

(3) the estimated storage capacity for each cavern associated with an unplugged well;

(4) a list of any caverns being washed;

(5) a list of the volume of product injected and withdrawn for each storage well;

(6) a list, by well number, of the type of product stored; and

(7) a list, by well number, of the maximum and minimum product storage pressures encountered during the report year.

(b) Each permittee shall maintain facility records at the facility or at a location approved by the secretary for the following time periods:

(1) A period of 10 years, for the following records:

(A) The maximum and minimum operating pressures for each storage well; and

(B) the annual inspections required by the secretary;

(2) the life of each storage well, for the following records:

(A) The casing records for each storage well;

(B) the cementing records for each storage well;

(C) the workover records;

(D) monitoring information, including calibration and maintenance records; and

(E) continuous monitoring data; and

(3) the life of the facility, for the following records:

(A) All logging events;

(B) all mechanical integrity tests and other testing;

(C) all groundwater monitoring data; and

(D) all correspondence relating to the permit, including electronic mail.

(c) Surface elevation surveys shall be maintained and retained for the life of facility plus 20 years after the facility's closure.

(d) If the facility permit is transferred, the former permittee shall provide all required facility records, reports, and documents to the new permittee. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

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28-45b-17. Well workovers. (a) Each permittee shall submit a workover plan to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment. The following provisions shall apply:

(1) Each permittee shall submit the workover plan at least 10 days before performing any downhole or well-head work that involves dismantling or removal of the wellhead.

(2) A permittee shall not be required to submit a workover plan for routine maintenance or replacement of gauges, sensors, or valves.

(3) Verbal authorization to initiate downhole or well-head work may be issued by the secretary if the permittee has fulfilled the requirements of this subsection.

(b) Each permittee shall ensure that a blowout preventer with a pressure rating greater than the pressures anticipated to be encountered is used during each workover.

(c) Each permittee shall ensure that all logging procedures are conducted through a lubricator unit with a pressure rating greater than the pressures anticipated to be encountered.

(d) Each permittee shall provide to the person logging a storage well or performing a well workover all relevant information concerning the status and condition of the storage well and cavern before initiating any work. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-18. Plugging and plugging-monitoring requirements. (a) Each permittee shall submit a plugging plan, including monitoring and testing requirements, to the secretary for review and consideration for approval at least 60 days before each plugging event.

(b) Each permittee shall follow the plugging procedure for a plugging event specified in the department's document titled "procedure for the plugging and abandonment of a crude oil storage well," procedure #UICLPG-29, dated October 2008, which is hereby adopted by reference.

(c) Each permittee wishing to place a storage well and cavern into plugging-monitoring status shall submit a plugging-monitoring plan to the secretary for review and consideration for approval at least 60 days before the plugging-monitoring event. The plan shall include the following:

(1) A schematic of the storage well configuration;

(2) the most recent results from the gamma-density log, the casing inspection log, the cement bond log, and the sonar survey; and

(3) the procedure for placing the cavern into plugging-monitoring status.

(d) Each permittee of a crude oil storage well to be placed into plugging-monitoring status may be required to perform additional testing or logging before placing the cavern into plugging-monitoring status if either of the following conditions exists:

(1) The required logging and testing are not current.

(2) A lack of storage well or cavern integrity poses a threat to public health, safety, or the environment.

(e) Each permittee of a storage well and cavern placed into plugging-monitoring status shall monitor the cavern pressure with a gauge on a weekly basis or continue to monitor pressures with a pressure transducer connected to a supervisory control and data acquisition system.

(f) Each permittee shall report any unexpected increase or decrease in pressure at a well in plugging-monitoring status to the secretary within 24 hours. Testing, logging, or any other necessary measures may be required by the secretary to determine if a threat to public health, safety, or the environment exists.

(g) Each permittee shall restore and preserve the integrity of the site as follows:

(1) Dispose of all liquid waste in an environmentally safe manner;

(2) clear the area of debris;

(3) drain and fill all excavations;

(4) remove all unused concrete bases, machinery, and materials; and

(5) level and restore the site. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-19. Underground crude oil storage fees.

(a) Each permit applicant shall submit a fee of \$700 for each proposed storage well with the permit application.

(b) Each permittee shall submit an annual permit fee of \$18,890 per facility and \$305 per unplugged storage well on or before April 1 of each year.

(c) Fees shall be made payable to the "Kansas department of health and environment — subsurface hydrocarbon storage fund."

(d) The fees collected under the provisions of this regulation shall not be refunded.

(e) If ownership of an underground crude oil storage well or underground crude oil storage facility changes during the term of a valid permit, no additional fee shall be required unless a change occurs that results in a new storage well or an expanded facility operation. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-20. Permit required for a brine pond. Since the underground storage of crude oil and the access to and transfer of crude oil are dependent on the safe and secure operation and maintenance of associated brine ponds, no person shall construct, operate, or maintain any brine pond associated with an underground crude oil storage facility without first obtaining a brine pond permit from the secretary. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-21. Brine pond permit application; permit renewal. (a)(1) Each applicant for a permit for a new brine pond shall submit an application to the secretary at least 90 days before the construction of the new brine pond commences. Brine pond construction shall not begin until the secretary has issued the permit.

(2) Upon review of the application, either of the following shall be issued by the secretary:

(A) A final permit if the application is approved; or

(B) a notice that the permit has been denied if the applicant has not complied with the applicable require-

ments of this article. The notice shall include justification for the permit denial.

(b) Each permit for a brine pond shall be authorized for a term not to exceed 10 years.

(c) Each permittee wanting to renew the permit shall submit a completed renewal application at least 90 days before the expiration date of the permit in effect.

(d) Each permit application for a new brine pond shall include a hydrogeological investigation conducted under the direction of a licensed geologist or a licensed professional engineer. Each hydrogeological investigation for a new brine pond shall include the following information:

(1) A site characterization for brine pond construction, which shall meet the following requirements:

(A) The bottom of the brine pond shall be determined by the lowest surface elevation of compacted or excavated soils used in creating the pond structure;

(B) all required excavations or boreholes shall be drilled to a depth of at least 10 feet below the bottom of the brine pond;

(C) the separation distance between the bottom of the brine pond and the water table, which shall meet one of the following requirements:

(i) A separation distance of at least 10 feet shall be maintained between the brine pond bottom and the water table; or

(ii) a separation distance of less than 10 feet shall require the installation of a clay tertiary subliner; and

(D) the surface area shall be measured at the interior top dike elevation;

(2) the location and elevation of each borehole or excavation, based on surface area, which shall be determined by the following criteria:

(A) At least two boreholes or excavations for each five acres of proposed brine pond surface area; or

(B) at least two boreholes or excavations if the brine pond surface area is less than five acres; and

(3) the following information for each borehole or excavation:

(A) A log of soil types encountered in each borehole or excavation; and

(B) a groundwater level measurement at each borehole or excavation.

(e) Each permittee shall notify the department at least five days before conducting any field activities for the hydrogeological investigation. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-22. Public notice for a brine pond. (a) Public notice shall be given by the secretary for the following permit actions:

(1) A permit application for any new brine pond associated with an underground crude oil storage well;

(2) a denied permit; and

(3) a scheduled hearing.

(b) The public notice and, if applicable, a copy of the draft permit shall be mailed or electronically mailed by the department to the permit applicant.

(c) Each public notice shall be mailed by the department to the following:

(1) Any person who submits a written request for placement on the mailing list;

(2) the official county newspaper of each county in which the lands affected by the application are located, for publication in at least two issues; and

(3) the Kansas register.

(d) Each public notice shall include the following information:

(1) The name and address of the department processing the permit action for which the notice is being given;

(2) the name and address of the person seeking the permit;

(3) a brief description of the activity described in the permit application;

(4) the name, address, and telephone number of the person that interested persons may contact for further information, including copies of the application, draft permit, or other appropriate information;

(5) a brief description of the comment procedures for public notice; and

(6) a statement of the procedure to request a hearing and other procedures that allow public participation in the final permit decision.

(e) Any interested person may submit written comments to the secretary on any permit action during the 30-day public comment period. The following requirements shall apply:

(1) Comments shall be submitted by the close of the public comment period.

(2) All supporting materials submitted shall be included in full. The supporting materials shall not be incorporated by reference, unless the supporting materials are any of the following:

(A) Part of the administrative record in the same proceeding;

(B) state or federal statutes and regulations;

(C) state or environmental protection agency documents of general applicability; or

(D) other generally available reference materials.

(3) Commentators shall make available to the secretary all supporting materials not already included in the administrative record.

(f) The response to all relevant comments concerning any permit actions and the reasons for changing any provisions in the draft permit shall be issued when the final permit decision is issued.

(g) The response to comments shall be made available to the public upon request. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-23. Modification and transfer of a brine pond permit; variance. (a) Any re-issuance or modification of a brine pond permit and any variance may be authorized by the secretary for a term of less than 10 years.

(b) The automatic transfer of a brine pond permit shall be prohibited. The terms of a permit transfer shall include the following:

(1) Each person requesting a permit transfer shall submit a completed application to the secretary at least 60 days before the proposed effective date of the transfer.

(continued)

(2) Each permittee shall comply with the requirements of the existing permit until the secretary reissues the permit.

(c) Any permit for a brine pond may be modified by the secretary for any of the following reasons:

(1) The secretary receives information not available when the permit was issued.

(2) The secretary receives a request for a modification.

(3) The secretary conducts a review of the permit file and determines that a modification is necessary.

(d) Only the permit actions subject to modification shall be reopened.

(e) Minor modifications that shall not require public notification shall include the following:

(1) Correction of typographical errors;

(2) requirements for more frequent monitoring or reporting by the permittee;

(3) date change in a schedule of compliance;

(4) change in ownership or operational control of the facility, unless the secretary determines that public notification is necessary to protect the public interest;

(5) change in construction requirements, if approved by the secretary; and

(6) amendments to a brine pond closure plan.

(f) A draft permit and notification to the public shall be required if any of the following conditions is met:

(1) A permittee proposes substantial alterations to the brine ponds or proposes any activity that justifies a change in permit requirements, including cumulative effects on public health, safety, or the environment.

(2) Information has become available that would have initially justified different permit conditions.

(3) The regulations on which the permit was based have changed because of the promulgation of new or amended regulations or because of a judicial decision.

(g) Any permittee may request a permit modification within 180 days after any of the following:

(1) The adoption of any new regulations;

(2) any deadline to achieve compliance with regulations before the expiration date of the permit; or

(3) any judicial remand and stay of a promulgated regulation, if the permit condition was based on the remanded regulation. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-24. Signatories for brine pond permit applications and reports. (a) Each applicant for a permit for a new brine pond shall designate at least one signatory to sign the permit applications and reports required by the secretary.

(b) The positions that may be approved by the secretary as signatories shall include any of the following:

(1) Operations manager;

(2) brine pond specialist; or

(3) any position with responsibility at least equivalent to that required by the positions listed in this subsection.

(c) Any signatory may submit written notification to the secretary specifying a position having responsibility for the overall operation of the facility or activity to act as a designated signatory.

(d) Each signatory and each signatory's designee shall submit a signature statement, on a form furnished by the department, to the secretary with the brine pond permit application. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-25. Financial assurance for brine pond closure. (a) Each applicant for a permit for a new brine pond shall submit, with the application and annually thereafter on or before the permit renewal date, proof of financial assurance to the secretary.

(b)(1) Each brine pond permittee shall establish financial assurance for the decommissioning and abandonment of any brine pond permitted by the secretary under this article.

(2) Each applicant and each permittee shall meet the following requirements:

(A) Submit a detailed written estimate, in current dollars, of the cost to close any brine pond at the facility. The estimate shall be reviewed and approved by a licensed professional engineer or licensed geologist;

(B) develop an estimate of the closure cost for each brine pond at the facility as follows:

(i) The estimate shall be based on the cost charged by a third party to decommission the brine pond in accordance with this article; and

(ii) the brine pond shall be assumed to be at maximum storage capacity; and

(C) increase the closure cost estimate and the amount of financial assurance provided if any change in the brine pond closure plan or in the operation increases the maximum cost of brine pond closure at any time.

(c) Each permittee shall provide continuous financial assurance coverage for closure until the secretary approves the brine pond closure.

(d) Each permittee shall comply with the provisions of the department's document titled "procedure for demonstrating financial assurance for a brine pond associated with a storage facility," procedure # UICLPG-30, dated October 2008, which is hereby adopted by reference. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-26. Design, construction, and maintenance of brine ponds. (a) Each applicant for a brine pond permit shall submit a design and construction plan for each new brine pond associated with an underground crude oil storage facility to the secretary. The design and construction plan shall be approved if the secretary determines that the plan is protective of public health, safety, and the environment. Each brine pond shall be designed by a licensed professional engineer.

(b) Each applicant shall ensure that the impermeable synthetic membrane liner system for each brine pond consists of primary and secondary impermeable synthetic membrane liners with an intermediate leak detection system. The following requirements shall apply:

(1) The primary and secondary liners shall each be at least 30 mils in thickness.

(2) The engineer designing the brine pond shall obtain a certification from the liner manufacturer providing the following information:

(A) Confirmation that the specified liner is compatible for use with the brine;

(B) confirmation that the specified liner is ultraviolet-resistant; and

(C) data for the manufacturer's estimated leakage, permeability, or transmissivity rate for specific liners, including the rate of movement of fluids through the synthetic membrane liner due to the properties and thickness of the liner material, expressed in units of volume per area per time;

(D) any normally expected manufacturing defects in the liner material; and

(E) any normally expected defects associated with the seaming and installation process.

(c) Each brine pond permittee shall submit a contingency plan to the secretary that outlines the procedures for brine containment issues associated with brine pond maintenance and dewatering due to liner failure, repair, replacement, or expansion of the brine pond. The contingency plan shall be approved if the secretary determines that the plan is protective of public health, safety, and the environment.

(d) Each permittee of an existing brine pond and each applicant for a permit for a new brine pond shall submit a flood response plan if the brine pond is located in a floodplain or a flood-prone area.

(e) Each permittee shall cease operations or shall comply with instructions from the secretary if the secretary determines that an imminent threat to public health, safety, or the environment exists due to any unsafe operating condition. The permittee may resume operations if the secretary determines that the brine pond operations no longer pose a risk to public health, safety, or the environment.

(f) Each permittee shall ensure that the primary and secondary liners for each brine pond are separated to provide a conduit for the movement of any fluid between the liners to the leak detection monitoring location for detection and removal.

(g) Each permittee shall ensure that all materials between the primary and secondary liners are capable of transmitting at least $\frac{1}{4}$ inch per acre per day of flow with a head of no more than two feet placed on the secondary liner. Acceptable materials shall include the following:

- (1) Clean sand;
- (2) pea gravel;
- (3) geotextile fabric;
- (4) geonet-type material; and

(5) any alternatives recommended by the liner manufacturer, if the secretary determines that the alternatives are substantially equivalent to materials listed in this subsection.

(h) Each permittee shall ensure that the leak detection system design for each brine pond limits the maximum travel time required for fluid penetrating the liner to reach the leak detection monitoring location to 24 hours or less.

(i) Each permittee shall ensure that the bottom of each brine pond has a slope adequate for the proper operation of the leak detection system, with not less than 0.5 percent for the slope for the collection pipes and 1.0 percent for all other slopes.

(j) Each permittee shall ensure that the dewatering system design for each brine pond is capable of the following:

(1) Monitoring the volume of fluid removed from the intermediate space between the primary and secondary liners; and

(2) pumping the volume of fluid generated equal to 10 times the maximum allowable liner leakage rate.

(k) Each permittee shall ensure that the compaction of all brine pond embankments and of the upper six inches of the interior lagoon bottom below the secondary liner meets all of the following requirements:

(1) The maximum standard proctor density shall be at least 95 percent at optimum moisture to optimum moisture plus three percent.

(2) The maximum thickness of the layers of material to be compacted shall not exceed six inches.

(3) The moisture content range of the compacted soils shall be optimum moisture to optimum moisture plus three percent.

(4) The maximum size of dirt clods in the compacted soil shall be less than one inch in diameter.

(l) Each permittee shall ensure that the following requirements for the installation of the liners at each brine pond are met:

(1) The primary and secondary liners shall be anchored at the top of the brine pond dike in accordance with the liner manufacturer's instructions.

(2) Installation shall be performed in accordance with the liner manufacturer's instructions.

(3) Installation shall be performed by a contractor experienced in the installation of impermeable synthetic membrane liners.

(4) On-site supervision of the liner installation shall be provided by an individual that has experience in liner installation practices.

(m) Each permittee shall ensure that the volume of fluid monitored from the intermediate leak detection system at the brine pond is based on a rate of 10 percent of leak return system capacity and does not exceed 1,000 gallons per day per acre of pond area.

(n) Each permittee shall submit, to the secretary, a seam testing method to verify the adequacy of the seaming process for the liners at each brine pond. The following requirements shall apply:

(1) The testing method shall include the following:

(A) The methods for destructive and nondestructive seam testing;

(B) the protocol describing the number of tests per lineal foot of field seam;

(C) the size of the destructive test specimen required; and

(D) any other pertinent quality control provisions recommended by the liner manufacturer.

(2) All field seams shall be subjected to nondestructive testing.

(o) Each permittee shall install an oil-brine separator to separate entrained product from the brine used to transfer product. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

(continued)

28-45b-27. Groundwater monitoring for brine ponds. (a) Each applicant for a permit for a new brine pond shall submit a groundwater monitoring plan with the application for a brine pond permit to the secretary for review and consideration for approval. The monitoring plan shall be approved if the secretary determines that the plan is protective of public health, safety, and the environment.

(b) Each applicant for a permit for a new brine pond shall meet the following requirements:

(1) Install monitoring wells around the perimeter of the brine pond. The well spacing shall be based on the geology and hydrogeology at the facility and shall be approved by the secretary if the secretary determines that the well spacing is protective of public health, safety, and the environment; and

(2) set the screen in all shallow groundwater monitoring wells at a depth that is inclusive of the seasonal fluctuation of the water table.

(c) Each applicant for a permit for a new brine pond shall submit, with the groundwater monitoring plan, a quality assurance plan to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment.

(d) Each permittee shall collect groundwater samples and analyze the samples for chloride and any other parameter determined by the secretary as posing a potential threat to public health, safety, and the environment. The reporting format shall be determined by the secretary.

(1) Each permittee shall submit the following to the department on a quarterly basis:

(A) The results for the chloride analyses from groundwater samples; and

(B) a static groundwater level measurement for each monitoring well.

(2) Each permittee shall monitor monthly for the presence of combustible gas in the headspace in monitoring wells and submit the results to the department on a quarterly basis.

(e) Any permittee of a brine pond where chloride concentrations in the groundwater exceed 250 milligrams per liter may be required by the secretary to submit a work plan, for review and consideration for approval, that describes proposed methods to delineate the extent of the contamination and to control migration of the chloride contamination. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

28-45b-28. Brine pond closure requirements. (a) Each brine pond permittee shall submit a closure plan, including monitoring and testing requirements, to the secretary for review and consideration for approval at least 60 days before the closure of a brine pond. The closure plan shall be approved if the secretary determines that the closure plan is protective of public health, safety, and the environment.

(b) The permittee shall not commence closure activities without the secretary's prior approval.

(c) Each permittee shall include the following information in the brine pond closure plan:

(1) The procedure for deactivating the various brine lines employed at the facility;

(2) the procedures for the remediation, removal, or disposal of brine, accumulated sludge in the brine pond, contaminated soils, and contaminated groundwater;

(3) a description regarding the proposed maintenance, deactivation, conversion, or demolition of the brine pond structure; and

(4) procedures addressing the plugging of any water wells or groundwater monitoring wells associated with the brine pond. (Authorized by K.S.A. 55-1,117 and K.S.A. 2008 Supp. 55-1,117a; implementing K.S.A. 55-1,117; effective July 6, 2009.)

Roderick L. Bremby
Secretary of Health
and Environment

Doc. No. 037146

INDEX TO ADMINISTRATIVE REGULATIONS

This index lists in numerical order the new, amended and revoked administrative regulations and the volume and page number of the *Kansas Register* issue in which more information can be found. Temporary regulations are designated with a (T) in the Action column. This cumulative index supplements the 2006 Volumes and the 2008 Supplement of the *Kansas Administrative Regulations*.

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3-3-1	Amended (T)	V. 27, p. 1091
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3-3-2	New (T)	V. 27, p. 1091
3-3-2	New	V. 27, p. 1517

AGENCY 4: DEPARTMENT OF AGRICULTURE

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4-7-900	Amended	V. 27, p. 1022	4-16-1c	Amended	V. 27, p. 1742
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